

## Background of the Invention

## Field of the Invention

### Description of the Related Art

Information is commonly stored on the Internet in the form of "pages" often comprising a "home page" relating to a general site and providing guidance and access to the contents at that site, the contents being contained in "sub-pages". A site includes a unique Internet Protocol address or Universe Resource Locator (URL). The site can thus be accessed from any access point to the Internet by entering the relevant address and displaying the site held at that address. The user accesses the Internet via a client computer, for example a PC linked to the Internet. The link will typically be via a modem and telephone line and a service provider or

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In another aspect, data terminals connected to the Internet are conventionally required to download applets in an appropriate agent implementation language from a host which is a complex and slow process.

### Objects of the Invention

It is a further object of the invention to provide an improved data device interconnection with the Internet.

### - Features of the Present Invention

According to the present invention there is provided a data terminal connectable to, and remote from, the Internet comprising a data input and an internal server

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According to the invention there is provided a  
5 mobile image recording unit connectable to the Internet  
via a wireless link comprising image recordal means, a  
server for creating an Internet site having an Internet  
Protocol address and representing the recorded image and  
a wireless link arranged to provide site access to  
10 requests directed to the site address.

According to the invention there is provided an Internet site creation and access system comprising a mobile unit including a server arranged to record images at a given geographical location and create a site representing the image internal to the terminal, wherein the mobile unit communicates with the Internet via a wireless link and users access the site at the mobile unit via the Internet.

According to the invention there is provided a method of creating a web site in which a mobile unit records data relating to its immediate environment, a server within the mobile unit creates a web site page representing the data and having an Internet Protocol address, and Internet users access the web site at the Internet Protocol address via a wireless link between the mobile unit and the Internet.

30           According to the invention there is provided an image capture and relay system comprising a remote still image capture device including an encoder for encoding the captured image as an image data signal and a transmitter for transmitting the image data signal, the

5       The image capture device may comprise a digital camera and many further include a bar code reader and/or a microphone and/or a user data input device and/or include a printer, preferably arranged to print bar code symbols or a hard copy version of the captured image.

According to the invention there is further provided a still image capture device comprising a digital camera, an encoder for encoding the still image as an image data signal, and a transmitter for transmitting the image data signal by wireless transmission to a remote base station.

30       The image captured may relate to the condition of goods prior to delivery and the received image may be transferred from the base station to a delivery point for comparison with the received goods.

The image captured may relate to the condition of goods to be delivered, the image data signal may be

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Fig. 11 shows an alternative configuration for the



terminal of Fig. 8.

#### Detailed Description of the Preferred Embodiments

5 A conventional Internet link is shown referring to the schematic diagram at Fig. 1, and block diagram of Fig. 2 and includes a remote terminal data device 1 comprising, for example, a lap-top computer, a PC or a mobile unit as discussed in more detail below linked to a server 2 via a suitable link 3 which can be a telephone  
10 link, incorporating a suitable modem, a wireless link or a cellular telephone link amongst other possibilities which will be evident to the skilled person. The server 2 is in turn interconnected via line 4 to the Internet shown schematically at 5. When the user wishes to access  
15 a web site the web site address is entered at terminal 1 and server 2 brings up the web site 6 at the given address from the Internet 5. Similarly when the user wishes to create a site, the relevant information is entered at terminal 1 and the site is created via server  
20 2.

Whilst the system shown in Fig. 1 allows centralised site access and creation, it will be appreciated in certain circumstances the system is cumbersome, for example where it is desired to create a site very  
25 quickly. In addition, whereas in some circumstances a user will simply know what information is sought, and will "browse" through the Internet to find a site containing that information, in some circumstances the user may be entirely aware of the exact site which he  
30 wishes to access irrespective of the information contained at the site. In that case the centralised system shown in Fig. 1 can give rise to unnecessary delays.

An improved system according to the present

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Digital cameras are well known and the detailed structure will be apparent to the skilled man such that a detailed description is not required here. Briefly, however, the digital camera includes a lens system 12 for focusing an image onto a CCD (charge coupled device) array. The image is thus pixelised and encoded, for example as a bit stream. The encoded signal is decoded and displayed on a visual display screen 14 or output as hard copy. A "still" image is obtained in the same manner but by recording an instantaneous image. The majority of the components of the digital camera are not shown in Fig. 5 for the purposes of clarity. A CCD camera is preferable over, say, a laser camera as images can be recorded from a greater distance.

In the embodiment shown, the data terminal 10 further includes various optional and required components. The principal required component is a wireless signal transmitter 18 which, as discussed in more detail below, relays the recorded image to a remote access point for distribution from that point. Optionally the data terminal 10 further includes a microphone 20 for recording, for example, a verbal description of the recorded scene, a bar code reader 22 allowing alternative or complementary operation of the data terminal 10, a physical interface 24 for downloading of information stored in the data terminal 10 to a

20           Once again specific details of the various  
individual components will be well known to the skilled  
reader and, for the purposes of clarity, are not repeated  
here.

In order to minimise costs the network architecture is designed to minimise the amount of data traffic over the highest cost communication links. This can be done for example by selecting a communication route which utilises the cheapest available lines. Where this can lead to delay a prioritisation system can be introduced ensuring that communications in respect of which delay is unimportant can be sent on a cost optimised basis whereas those signals for which the speed of transmission is important are sent on a urgency basis. For example where wireless communication gives rise to high costs as

An alternative terminal configuration can be based on the arrangement disclosed in US Application Serial No. 08/691,263, filed August 2 1996, assigned herewith. That specification describes a modular type terminal having interchangeable data collection modules, together with a detailed discussion of communications between mobile units and the Internet.

According to the embodiment any suitable form of wireless communication between the client/server and the Internet can be utilised. Such systems are well known for roaming units, whereby access points to the Internet

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the home page at step 126, allowing display of any desired page, returning to step 120. The system thus allows quick and easy operation with no programming required and in particular no HTML requirement. An instantaneous web page can be set up using the server software, the image to be displayed being stored simply by pointing the terminal at it and "clicking". Once again, the system can be designed with cost optimization in mind, ensuring that a minimum amount of data traffic occupies high-cost communication links.

Referring to Fig. 6 one possible implementation of an alternative embodiment of the present invention is shown. Where, for example, the police or other authorities, or an insurance operative wish to record details of a scene shown generally at 30, the image is captured as a still digital camera image by the data terminal 10 in the manner discussed above. The stored image is encoded, for example as a bit stream and the bit stream is transmitted or relayed via the transmitter 18 to a remote point.

In the embodiment shown the image information is relayed from transmitter 18 to an intermediate booster transmitter 32. This can either be one of a network spread across an area or can, for example, be carried in the data terminal user's vehicle or a carrying case. The use of a booster transmitter 32 reduces the broadcast power requirements of the data terminal 10 allowing more space to be dedicated to data storage/processing means or accessories, and increasing the battery life. It will be appreciated that the booster transmitter is, however, optional and in many cases will not be required. Transmission can take place via a RF wireless link microwave or other suitable wireless communication method. Where the vehicle is part of a larger GPS

monitored tracking system the arrangement of the present invention can be a module incorporated into the system.

5        Either the transmitter 18 in the data terminal 10 or the booster transmitter 32 relays the image information to an access point 34 including a receiver for receiving the relayed information signal. The received signal is input to a processor/data storage/decoder device 36. The image can then be transferred to any desired device, for example a central data storage device for the user to  
10        access on return to his premises (for example an Intranet or LAN), or a news and information network (such as the Internet) where it is desired to broadcast the image, or to a police or other authorities' information database where it is desired to record and document the image.  
15        The transmitted signal from the data terminal 10 may also include information such as the desired destination of the image, additional information relating to the circumstances, encoded information representative of recordings of any verbal messages or recordings of sound  
20        messages further explaining the circumstances as recorded by the microphone 20. Information relating to the circumstances, or the destination of the image can be input via keyboard 16.

25        Where the web page is created on site at the terminal using a internal server, the transmission system described above can equally be used for third party access to the web page.

30        A block diagram showing the components of the data terminal 10 is illustrated in Fig. 7. The data terminal includes various inputs comprising suitable transducers for converting the input signals to electronic signals. The inputs include the digital camera input 44 including a CCD array transducer, an audio signal input 46 including a microphone transducer and a bar code symbol

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Accordingly it will be seen that in one aspect the image data can be captured automatically and transmitted to a common database accessible to authorised users. The images could be transported and/or accessed via video servers, collaborative work group software and distributed multimedia, and implemented by desktop video teleconferencing. Processing of the image can be carried out on the raw data once it has been transmitted to the main network, allowing a further reduction in the processing requirements and hence the power and space requirements for the data terminal itself.

5 It will be seen that a wide range of applications  
are available, in particular relating to industries  
generally in which photographic (digital) images are  
regularly taken in the field. An alternative to the  
insurance claims documentation application discussed  
0 above, where bids/estimates were involved the item in  
respect of which the bid/estimate is provided,  
documenting for example the work required on the basis of  
which the bid or estimate was based could be recorded.  
Similarly where repair work or improvement work was  
5 contemplated, an appraisal could be made taking into  
account stored images. The system could be used as a  
general aid to documentation of items or circumstances.  
As discussed above, the system could be implemented in  
law enforcement. For example the scene of a crime or an  
0 accident could be stored and relayed or accessed. Indeed  
felons could be photographed and the image compared  
against a suitable database for identification purposes  
using known image comparison techniques. The system can  
also be used as a preliminary aid to more exhaustive  
5 documentation of circumstances such as proofing and/or  
test shots. The data is preferably relayed as determined  
by a network architecture designed to reduce transmission  
costs by minimising transmissions over high-cost  
communication links.

30 As will be seen for all of the above possible applications and all other applications the system includes particular and significant advantages, in particular providing immediate access to images for third parties privy to the image distribution network,

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As a result false alarms can be to a large extent avoided. It will be seen that a similar approach can be adopted for other hazard detectors, where an image of the scene is transmitted to suitable authorities when a

A further implementation for which the system of the present invention according to a further aspect would be particularly suited and which would benefit from the advantages discussed above is in the field of goods transfer, for example parcel delivery. When a damaged parcel is received there is no way to know immediately the condition of the parcel when shipped. The system of the present invention would, however, be able to acquire the image and transmit it to a remote location or create a suitable web page on site. The image could then be accessed at the receiving depot and compared with the actual received parcel to establish whether the condition had changed in any way. An alternative option would be to print the image information in a bar code format, the bar code itself being attached to the parcel itself. The bar code symbol could be decoded at the receiving depot, once again to compare the image with the received parcel. Evidently a high resolution bar code symbol will be required, for example under protocol PDF 417. The reader shown in Fig. 5 includes the capability for such an arrangement including a printer and printer slot 26.

It will be appreciated that the embodiments described above relate to specific possible implementation of the invention, and that the invention embraces a number of alternatives. For example, as shown in Fig. 8 the data terminal 10 is configured with ergonomic considerations in mind, fitting comfortably into the palm of the user's hand. As a result the data terminal 10 can be quickly and accurately directed towards an image to be recorded, using the visual display screen to ensure that the image is as desired. At the same time the keyboard can be manipulated comfortably

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UPC/EAN, Coder 128, Codabar and Interleaved 2 of 5.

One known type of bar code reader comprises a data wand as disclosed in US Patent No. 4,471,218, incorporated herein by reference.

5        Fig. 10 shows a data terminal 10 of the type described herein above further incorporating an optical reader 110 incorporated in the data terminal 10. The reader 110 includes reading beam generating and detecting means and the data terminal 10 includes processing means  
10        for decoding the detected encoded information. The reader 110 may comprise either a "flying-spot" laser scanner including means for scanning the reading beam or a "field of view" optical reader including a CCD array as detector. Both types of reader will be well known to the  
15        skilled reader and a full description of the components and operation is not provided here.

It will be appreciated that a wide range of implementations can be envisaged for the data terminal 10 shown in Fig. 10. In particular it may be useful in many  
20        circumstances to be able to read information encoded in bar codes to adduce additional information to that retrieved by the data terminal from the external environment.

A particularly advantageous embodiment is shown in  
25        Fig. 10. In particular a book or other printer matter 114 is provided which can be carried by the user including printed bar codes 116 which are read by the reader 110 and the information contained therein utilised by the data terminal 10. As discussed in more detail  
30        below, the data terminal 10 in fact comprises an Internet server capable of creating a web site at the data terminal carrying, for example, information relating to the external environment around the data terminal for access by users elsewhere on the Internet. In such

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The invention allows the user to carry a conventional book - for example having five hundred pages of 2-D applet codes. Such a book would not be cumbersome and would indeed be attractive to many users. The system allows greatly accelerated downloading of applets in as little as fifteen seconds. Conventional downloading systems would still be waiting for connection to the host in that range of time scale.

It will be seen that the data terminal can communicate with any suitable data network, for example an access point to the Internet, or to a closed dedicated system relating to the user or to which the user



5           It will be appreciated that any of the features discussed in relation to one embodiment can, as appropriate, be incorporated in any other embodiment without departing from the teaching of the present specification.

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